

## Double Athletic Ball Bounce Efficiency Instructions and Rubric

### Honors Physics

#### 20 Points Total

The purpose of this lab is to see the efficiency when dropping two athletic balls on top of each other. We will use a ball with a large diameter (basketball, volleyball, soccer ball) as the bottom ball, and place a tennis ball on top of the larger ball. By measuring the initial and final heights and performing some calculations, we can determine the efficiency of the system.

#### Instructions:

1. Place two metersticks on top of each other to create a measuring device that is 2 m tall.
2. Place the tennis ball on top of the larger ball, with the point where they meet at 50 cm.
3. Drop the two athletic balls together, and record the height at which they both bounce.
4. When dropping, the tennis ball should go straight upwards for the best results.
5. Repeat for four trials.
6. Change the larger ball with another group, and repeat steps 1-5.

#### Rubric:

1. Procedure (2 points).
2. Draw a picture of the setup (2 points).
3. Create a data table listing the initial height, final height, initial potential energy, final potential energy, and efficiency (3 points).
4. Calculations for initial and final potential energy and efficiency of both combinations (6 points; 1 for each athletic ball, twice).
5. Sources of error and improvements in the experiment (4 points; 2 each).
6. Conclusion, discussing the experiment and where the energy lost could have gone (3 points).